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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/520,408	05/17/2005	Thomas P. Quinn	UVMO:023US	2719

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EXAMINER	
HOLLERAN, ANNE L	
ART UNIT	**PAPER NUMBER**
1643	

MAIL DATE	DELIVERY MODE
07/27/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/520,408	QUINN ET AL.	
	Examiner	Art Unit	
	Anne L. Holleran	1643	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 May 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *5 and 6* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 7-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/05, 8/05, 1/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☒ Other: Notice to Comply

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I (claims 1-4 and 7-20) in the reply filed on 5/15/2007 is acknowledged.

2. Claims 1-20 are pending. Claims 5 and 6, drawn to non-elected inventions, are withdrawn from consideration.

Objections

3. This application contains sequence disclosures that are encompassed by the definitions for nucleotide and/or amino acid sequences set forth in 37 CFR 1.821(a)(1) and (a)(2). However, this application fails to comply with the requirements of 37 CFR 1.821 through 1.825 because the sequence "KCCYSL" does not have a sequence identifier in the claims. Furthermore, applicant is advised to review the specification for other instances of sequences without sequence identifiers. Correction is required.

APPLICANT IS GIVEN THE TIME PERIOD OF THIS OFFICE ACTION WITHIN WHICH TO COMPLY WITH THE SEQUENCE RULES, 37 CFR 1.821 - 1.825. Failure to comply with these requirements will result in ABANDONMENT of the application under 37 CFR 1.821(g). Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136. In no case may an applicant extend the period for response beyond the six month statutory period. Applicant is requested to return a copy of the attached Notice to Comply with the response.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-4 and 7-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The basis of this rejection is that the specification fails to adequately support a genus of peptides that comprise the sequence KCCYSL.

Claim 1 is drawn to a method for targeting an agent to a cell expressing ErbB-2 comprising bringing said cancer cell into contact with a peptide-agent complex, wherein said peptide comprises the sequence KCCYSL. The contact may be in vivo (claims 16-20). The cell may be a cancer cell that is a breast cancer cell or a prostate cancer cell. The agent may be a diagnostic agent that is a radiolabel, a chemilluminescent label, a fluorescent label, a magnetic spin resonance label or a dye. The complex may further comprise a linking moiety that connects the agent and the peptide.

Because the claims recite methods comprising administering a peptide-agent complex where the peptide comprises KCCYSL or the peptide is between 6 and about 100 residues in length, or the peptide is between 56 and about 50 residues in length, or the peptide is between 6 and about 25 residues in length or the peptide is between about 6 and about 15 residues in length, the claimed methods encompass methods using a genus of peptides to make up the peptide-agent complex.

For a claim drawn to a genus, the written description requirement may be satisfied through sufficient description of a representative number of species by actual reduction to practice or by disclosure of relevant, identifying characteristics, i.e. structure or other physical and/or chemical properties, by functional characteristics coupled with a known or disclosed correlation between function and structure, or by a combination of such identifying characteristics, sufficient to show the applicant was in possession of the claimed genus. A "representative number of species" means that the species, which are adequately described, are representative of the entire genus. Thus, when there is substantial variation within the genus, one must describe a sufficient variety of species to reflect the variation within the genus (see Official Gazette 1241 OG 174, January 30, 2001).

In the present application, the specification provides one example of the peptide portion of the peptide-agent complex to be used in the claimed methods. The one example is where the peptide consists of the sequence KCCYSL. The function of the peptide in the peptide-agent complex is that of targeting the agent to a cell expressing ErbB2. The specification demonstrates that a peptide consisting of the sequence binds to ErbB2, but fails to demonstrate any other species of peptide. Because of the term "comprising" the claims encompass using peptide-agent complexes where the peptide is possibly much larger than the exemplified hexamer (KCCYSL). Thus the genus of peptides to be used in making the peptide-agent complex is large and varied. Furthermore, the hexamer may be buried within the sequence of many of the peptides encompassed by the claims. Because the function of the peptide-agent complex depends on the binding ability of the peptide, and because there is no evidence or discussion provided by the specification concerning the loss of binding function of the hexamer if positioned in the middle

or even at one end of a very long peptide or protein sequence, the exemplified peptide consisting of the sequence KCCYSL is not representative of the large and varied genus of peptides encompassed by the claims. Therefore, one of skill in the art would not find that applicant was in possession of the claimed methods that encompass using peptide-agent complexes, where the peptide portion of the complex comprises the sequence of KCCYSL.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. Claims 1, 2, and 7-13 are rejected under 35 U.S.C. 102(a) as being anticipated by Karasseva (Karasseva, N.G. et al., Journal of Protein Chemistry, 21(4): 287-296, 2002, May).

It is noted that the publication date of Karasseva is less than one year from the effective filing date of the instant application. However, the authorship of Karasseva falls under the category of "another inventor", because it names inventors that are not named as co-inventors in the instant application. MPEP 2132 defines "another inventor" as any combination of authors or inventors different that the inventive entity of the application. The term "another" in 35 U.S.C. 102(a) refers to any entity which is different from the inventive entity. The entity need only differ by one person to be "by another".

Karaseva teaches the p6.1 peptide which consists of the sequence KCCYSL, and teaches a complex where the p6.1 peptide is biotinylated. Karaseva teaches contacting ErbB2 breast and prostate cancer cells with the biotinylated p6.1 peptide (see page 293, cell-binding assay). Therefore, Karaseva teaches the claimed methods.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-4, and 7-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Karasseva (supra) in view of Thakur (Thakur, M.L. et al., J. Nuclear Medicine, 41: 107-110, 2000) and further in view of Langer (Langer, M. et al. Curr. Med. Chem., Anti-Cancer Agents, 1: 71-93, 2001).

Karasseva teaches the p6.1 peptide which consists of the sequence KCCYSL, and teaches a complex where the p6.1 peptide is biotinylated. Karasseva teaches contacting ErbB2 breast and prostate cancer cells with the biotinylated p6.1 peptide (see page 293, cell-binding assay). Karasseva suggests that p6.1 has the potential to be developed into a cancer imaging agent targeting malignant cells overexpressing the ErbB2 receptor because KCCYSL distinguishes between ErbB2 overexpressing cells and cells with low ErbB2 expression. A cancer imaging method falls within the scope of the methods of claims 16-20, where the cell to be contacted with the peptide-agent complex is located in a subject or a human subject, where the complex is delivered locally or regionally, delivered systemically or delivered into vasculature of a tumor comprising the cell. However, Karasseva fails to teach that the diagnostic agent is a radiolabel or one of the radiolabels listed in claim 4.

Thakur teaches a method of administering ^{99m}TC (^{99m}technetium)-labeled vasoactive intestinal peptide (VIP), which is a peptide that binds to specific receptors in certain malignant tumors (see abstract). Thakur teaches a method of modifying VIP to enable labeling with ^{99m}TC. Thakur teaches administering the labeled peptide intravenously to human patients with tumors,

and teaches imaging of the tumors to measure uptake of label (see page 108-111). In vivo administration would result in delivery of a labeled peptide to a cancer cell and to the entire patient and also to the vasculature of the cell.

Langer teaches method of labeling cancer-targeting peptides with radionuclides (see pages 73, 2nd column – 76, first column). Langer teaches that peptides are considered ideal agents for targeting tumor cells in vivo (see page 71-72).

Therefore, it would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to have used the methods of Takur or Langer to modify the peptide of Karasseva to make a ^{99m}TC-labeled p6.1 peptide that could be used to contact cancer cells that overexpress ErbB2 cells in a patient. One would have been motivated by the teachings of Langer that peptides have emerged as a new class of radiopharmaceuticals for use in nuclear medicine for tumor scintigraphy (see abstract).

Conclusion

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anne Holleran, whose telephone number is (571) 272-0833. The examiner can normally be reached on Monday through Friday from 9:30 am to 5:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Helms, can be reached on (571) 272-0832. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-1600.

Papers related to this application may be submitted to Group 1600 by facsimile transmission. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Official Fax number for Group 1600 is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

Anne L. Holleran
Patent Examiner
July 23, 2007

ALANA M. HARRIS, PH.D.
PRIMARY EXAMINER

Notice to Comply	Application No. 10/520,408	Applicant(s) QUINN ET AL.	
	Examiner Anne L. Holleran	Art Unit 1643	

NOTICE TO COMPLY WITH REQUIREMENTS FOR PATENT APPLICATIONS CONTAINING NUCLEOTIDE SEQUENCE AND/OR AMINO ACID SEQUENCE DISCLOSURES

Applicant must file the items indicated below within the time period set the Office action to which the Notice is attached to avoid abandonment under 35 U.S.C. § 133 (extensions of time may be obtained under the provisions of 37 CFR 1.136(a)).

The nucleotide and/or amino acid sequence disclosure contained in this application does not comply with the requirements for such a disclosure as set forth in 37 C.F.R. 1.821 - 1.825 for the following reason(s):

☐ 1. This application clearly fails to comply with the requirements of 37 C.F.R. 1.821-1.825. Applicant's attention is directed to the final rulemaking notice published at 55 FR 18230 (May 1, 1990), and 1114 OG 29 (May 15, 1990). If the effective filing date is on or after July 1, 1998, see the final rulemaking notice published at 63 FR 29620 (June 1, 1998) and 1211 OG 82 (June 23, 1998).

☐ 2. This application does not contain, as a separate part of the disclosure on paper copy, a "Sequence Listing" as required by 37 C.F.R. 1.821(c).

☐ 3. A copy of the "Sequence Listing" in computer readable form has not been submitted as required by 37 C.F.R. 1.821(e).

☐ 4. A copy of the "Sequence Listing" in computer readable form has been submitted. However, the content of the computer readable form does not comply with the requirements of 37 C.F.R. 1.822 and/or 1.823, as indicated on the attached copy of the marked -up "Raw Sequence Listing."

☐ 5. The computer readable form that has been filed with this application has been found to be damaged and/or unreadable as indicated on the attached CRF Diskette Problem Report. A Substitute computer readable form must be submitted as required by 37 C.F.R. 1.825(d).

☐ 6. The paper copy of the "Sequence Listing" is not the same as the computer readable from of the "Sequence Listing" as required by 37 C.F.R. 1.821(e). The correct SEQ ID NO:2 is present in the paper copy of the of the sequence listing only. Therefore a search of the correct sequence is not possible.

☒ 7. Other: sequence in claims lacks an identifier

Applicant Must Provide:

☐ An initial or substitute computer readable form (CRF) copy of the "Sequence Listing".

☐ An initial or substitute paper copy of the "Sequence Listing", **as well as an amendment specifically directing its entry into the application**.

☐ A statement that the content of the paper and computer readable copies are the same and, where applicable, include no new matter, as required by 37 C.F.R. 1.821(e) or 1.821(f) or 1.821(g) or 1.825(b) or 1.825(d).

For questions regarding compliance to these requirements, please contact:

For Rules Interpretation, call (703) 308-4216 or (703) 308-2923
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